

**METHODS FOR FORMING METAL INTERCONNECTIONS FOR
SEMICONDUCTOR DEVICES USING A BUFFER LAYER ON A TRENCH
SIDEWALL, AND SEMICONDUCTOR DEVICES SO FORMED**

Abstract of the Disclosure

A metal interconnection for an integrated circuit device is fabricated by forming a trench in an integrated circuit substrate and a via hole beneath a portion of the trench. The trench includes a trench sidewall and the via hole includes a
5 sacrificial film therein. A buffer layer is formed on the trench sidewall. At least some of the sacrificial film is removed from the via hole by etching the sacrificial film through the trench that includes the buffer layer on the trench sidewall. The metal interconnection is formed in the via hole from which at least some of the sacrificial film has been removed, and in the trench. The buffer layer may use material having
10 etch selectivity to an etchant which is used when removing the sacrificial film, to thereby protect the trench sidewall when removing the sacrificial film.